

1.2 User Instruction

1.2.1 Instructions

This manual has been prepared for the use of all engineers who become involved with drainage facilities funded through or owned by the ConnDOT. Its purpose is to present the best available methods, guidelines, and criteria in useable form for drainage design. It is expected that the criteria and methods set forth herein will be used in the design of the drainage facilities for the Department.

However, it is also recognized that new and improved design concepts or understandings are continually being devised, and the Department promotes and encourages the use of such improved procedures when they have been submitted to the Hydraulics and Drainage Section for review and approval prior to use. To the extent feasible, this manual will be kept current to include improved design procedures that have been proven to be sound and effective.

It must also be recognized that regardless of the degree of sophistication of drainage standards and criteria, each drainage design problem is unique and may require the use of considerable engineering judgment to fit or adjust a standardized design method to a particular site.

It is the job of the designer to develop the required hydrologic and hydraulic data for any given project or site. Using this base data, the designer must determine the best overall solution when a design may present facts involving conflicting value judgments such as economics vs. environmental considerations.

The need for proper field site investigations, collection of data, analysis of data, and exercise of judgement are the foundations of good drainage design that will enable proper use of the criteria set forth in this manual.

Ultimately, the submission of complete hydraulic reports documenting the basis for the hydrology and hydraulic design is a requirement for work to be performed or reviewed by the Department's forces. Such reports serve as valuable sources of information for evaluating the performance of the constructed facilities and also serve as aids in analyzing the needs for future improvements.

The Hydraulics and Drainage Section is available to provide assistance to users and would appreciate any constructive suggestions or comments that would improve the contents of this Drainage Manual. All users of this manual are encouraged to submit comments and/or corrections on the form provided in Appendix A.

1.2.2 Updates

The ConnDOT will issue update changes to this manual as required. These revisions will be disseminated to the user by memo from the Manager of Design Services. It is the designer's responsibility to ensure the latest revision is being used. The most current manual is also available on the Department's web site.

1.2.3 Consultant Engineers

Consultant Engineers should also refer to the current editions of the ConnDOT Bridge Design Manual, Consultant Engineers Manual, Highway Design Manual, and other pertinent ConnDOT manuals to ensure that the minimum standards as outlined are met. In addition, pertinent Department of Environmental Protection (ConnDEP) manuals and guidelines should be referenced to ensure the design satisfies permit requirements, where applicable.

1.2.4 Hydraulic Engineer Approval

In order to ensure Quality Control/Quality Assurance on hydraulic designs **for structures which convey watercourses greater than 2.6km² (1mi²), the engineer performing the analysis must be approved by ConnDOT on a project by project basis.** The Department requires that an individual responsible for the work be a licensed Connecticut Professional Engineer. The procedure for Department approval is outlined in the CE Manual. Approval requests for previously qualified engineers to work on other State projects will not require the resubmission of a resume. However, an approval request for the current project together with a copy of the Department's prior approval letter and an updated list of hydraulic designs performed by the candidate is required.

1.2.5 ConnDOT Highway Encroachment Permit

In accordance with the Highway Encroachment Permit Regulations, this manual shall be used in conjunction with all Highway Encroachment permits which require modifications to existing systems and/or new drainage facilities within the State's right of way. The facilities and supporting documentation shall conform to all requirements set herein or as required by the District Drainage Engineer.

1.2.6 Major Traffic Generators

This manual shall be used as a basis for all activities affecting State drainage facilities as related to the proposed development. As a minimum, the applicant shall include a narrative addressing the following:

1. The existing and proposed drainage patterns on the site. This section would specifically state the following; (a) Existing drainage patterns are being maintained on the proposed site and there is no diversion(s) of storm water runoff; (b) There is a proposed storm water diversion(s) that is directed away from a State drainage facility or (c) There is a proposed storm water diversion(s) that is directed to a State drainage facility. Diversion of storm water runoff to State drainage facilities is generally not approved unless appropriate drainage rights are obtained from affected downstream property owners.
2. The proposed drainage design and its relation to any adjacent existing State drainage facilities. The effect of the proposed site development and drainage design on State drainage facilities should be described. While it is recognized that it may not be possible to include final drainage design and computations early in the development of the project, sufficient information should be provided to demonstrate that the proposal is feasible.
3. The features included in the proposed drainage design to treat storm water and enhance storm water quality for sites involving a direct connection to a State drainage system.

Topographic plans with contours showing existing and proposed drainage areas, including any off-site areas draining toward the project, are required.

It should be noted that if a ConnDOT encroachment permit is required, then Section 1.2.5 must be complied with.

1.2.7 Abbreviations

Following are the abbreviations used in this manual.

AASHTO – American Association of State Highway and Transportation Officials
ACPA – American Concrete Pipe Association
AISI – American Iron and Steel Institute
AISC – American Institute of Steel Construction
ASTM – American Society of Testing and Materials
AREA – American Railway Engineering Association
BMP – Best Management Practices
CFR - Code of Federal Regulations
CGS – Connecticut General Statute
ConnDEP – Connecticut Department of Environmental Protection
ConnDOT – Connecticut Department of Transportation
EA – Environmental Assessment
EIS – Environmental Impact Statement
EPA - Environmental Protection Agency
FDSA – Federal Dam Safety Act
FEMA - Federal Emergency Management Agency
FHBM – Flood Hazard Boundary Map
FBFM – Flood Boundary and Floodway Map
FHPM - Federal-Aid Highway Program Manual
FHWA - Federal Highway Administration
FRA - Federal Railway Administration
FWS - Fish and Wildlife Service
IECA – International Erosion Control Association
IWRD – Inland Water Resources Division (ConnDEP)
LTEC – Least Total Expected Cost
MDC – Metropolitan District Commission
NBIS – National Bridge Inspection Standards
NCHRP – National Cooperative Highway Research Program
NCSPA – National Corrugated Steel Pipe Association
NFIP – National Flood Insurance Program
NMFS - National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
NPDES – National Pollutant Discharge Elimination System
NPS - National Park Service
NRCS - Natural Resources Conservation Service; formerly Soil Conservation Service (SCS)
OCZM - Office of Coastal Zone Management
Stat. - Statute
U.S.C. - United States Code
USCE - U.S. Corps of Engineers
USCG - U.S. Coast Guard
USDA – United States Department of Agriculture
USFS - U.S. Forest Service
USGS – United States Geological Survey